

ABSTRACT OF THE DISCLOSURE

[0076] A method for making a ferritic stainless steel article having an oxidation resistant surface includes providing a ferritic stainless steel comprising aluminum, at least one rare earth metal and 16 to less than 30 weight percent chromium, wherein the total weight of rare earth metals is greater than 0.02 weight percent. At least one surface of the ferritic stainless steel is modified so that, when subjected to an oxidizing atmosphere at high temperature, the modified surface develops an electrically conductive, aluminum-rich, oxidation resistant oxide scale comprising chromium and iron and a having a hematite structure differing from Fe_2O_3 , $\alpha\text{-Cr}_2\text{O}_3$ and $\alpha\text{-Al}_2\text{O}_3$. The modified surface may be provided, for example, by electrochemically modifying the surface, such as by electropolishing the surface.